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09/770,541	01/26/2001	Prithviraj Banerjee	NWU-P001	6788

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THE LAW OFFICE OF DEEPTI PANCHAWAGH-JAIN
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EXAMINER
CHU, CHRIS C

ART UNIT	PAPER NUMBER
2815	

DATE MAILED: 12/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>04 August 2003</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disp sition of Claims

4)☒ Claim(s) *18 - 37, renumbered (37 C.F.R. 1.126)* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *18 - 37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

    a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4)☐ Interview Summary (PTO-413) Paper No(s). _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: .

DETAILED ACTION

Response to Amendment

1.   Applicant's amendment filed on August 4, 2003has been received and entered in the case.

Claim Objections

2.   Claim 33 is objected to because of the following informalities: Claim 33 is missing. Appropriate correction is required.

3.   The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

For examination purposes, misnumbered claims 34 - 38 been renumbered 33 - 37. Applicant must either amend claim numbering accordingly or add a new claim 33.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5.   Claims 18 - 37 are rejected under 35 U.S.C. 102(e) as being anticipated by

Schaumont et al. (U.S. Pat. Num. 6,233,540).

Regarding claims 18, 25 and 26, Schaumont et al. discloses in Figs. 1 - 23 and

column 6, line 56 a system for compiling a functional description expressed in an

interpretive, algorithmic language into target code for selected hardware comprising:

-    a parser (C++ High Level System Description in Figs. 16 and 22) for

     receiving the functional description expressed in the interpretive, algorithmic

     language with at least one undeclared variable;

-    a type-shape analyzer (C++ Timed, Bittrue System Description in Figs. 22 and

     23), coupled to the parser, for assigning a type and a dimension to the at least

     one undeclared variable by analyzing the functional description to form an

     abstract syntax tree;

-    a statement deconstructor (FSMD Data Structure in Figs. 11 and 22), coupled

     to the type-shape analyzer, for transforming a compound statement in the

     abstract syntax tree into a series of single statements (claim 1) and at least one

     simple statement (e.g. claim 25); and

-    a translator (C++ RT Description), coupled to the statement deconstructor, for

     translating the abstract syntax tree into a register transfer level format.

Regarding claims 19, 27 and 34, Schaumont et al. discloses in Figs. 1 - 23 further

comprising: a user directive file (Initial Data-Vector Description, column 9, lines 55 -

63), coupled to the parser, for annotating the functional description with at least one user

defined directive selected from the group consisting of constraint directives, assertions,

and compiler hints.

Regarding claims 20, 28 and 35, Schaumont et al. discloses in Figs. 1 - 23 further

comprising: a precision analyzer (C++ Signal-flowgraph, column 14, lines 14 – 27 and

lines 50 - 67), coupled to the type-shape analyzer, for determining the precision of the at

least one undeclared variable and analyzing a value range of the at least one undeclared

variable.

Regarding claims 21 and 29, Schaumont et al. discloses in Figs. 1 - 23 further

comprising: a real number parser (column 18, lines 21 - 30), coupled to the precision

analyzer, for parsing a real number into an integer part and a fractional part. wherein said

real undeclared variable is one of said at least one undeclared variable.

Regarding claims 22, 30 and 36, Schaumont et al. discloses in Figs. 1 - 23 further

comprising: a memory access optimizer (Fig. 11), coupled to the statement deconstructor,

for analyzing array access patterns across loop iterations and replacing a statement in a

loop including a memory access with multiple statements including the memory access to

reduce the number of individual memory accesses.

Regarding claims 23, 31 and 37, Schaumont et al. discloses in Figs. 1 - 23 further

comprising: a pipeline optimizer (column 7, line 66 – column 8, line 7), coupled to the

statement deconstructor, for analyzing compound loop structures to identify pipeline

opportunities and applying the pipeline algorithm to pipeline opportunities to generate

nodes corresponding to the loop body, predicate nodes corresponding to loop conditional

statements, and a schedule for scheduling pipeline operations.

Regarding claims 24 and 32, Schaumont et al. discloses in Figs. 1 - 23 the

statement deconstructor for transforming a compound statement in the abstract syntax

tree into at least one simple statement comprises: a scalarizer (lines 16 – 18 in Fig. 11),

coupled to the type-shape analyzer, for expanding a matrix operation into at least one

loop.

Regarding claim 33, Schaumont et al. discloses in Figs. 1 - 23 one or more

computer readable storage devices having computer readable code embodied on said

computer readable storage device, said computer readable code for programming one or

more computers to perform a method for compiling a functional description expressed in

an interpretive, algorithmic language into target code for selected hardware, the method

comprising the steps of:

- receiving the functional description (C++ High Level System Description in

    Figs. 16 and 22) expressed in the interpretive, algorithmic language with at

    least one undeclared variable;

- assigning (C++ Timed, Bittrue System Description in Figs. 22 and 23) a type

    and dimension to the at least one undeclared variable by analyzing the

    functional description to form an abstract syntax tree;

- transforming (FSMD Data Structure in Figs. 11 and 22) compound statements

    in the abstract syntax tree into a series of single statements; and

- translating (C++ RT Description) the abstract syntax tree into a register

    transfer level format.

Response to Arguments

6.   Applicant's arguments with respect to claims 18 - 37 have been considered but are

moot in view of the new ground(s) of rejection.

Conclusion

7.   Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the

advisory action. In no event, however, will the statutory period for reply expire later than

SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Chris C. Chu whose telephone number is (703) 305-6194.

The examiner can normally be reached on M-F (10:30 - 7:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone number for

the organization where this application or proceeding is assigned is (703) 308-7382.

Any inquiry of a general nature or relating to the status of this application or

proceeding should be directed to the receptionist whose telephone number is (703) 308-

0956.

Chris C. Chu
Examiner
Art Unit 2815

c.c.
12/1/03 11:23:43 AM

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